



**akuTEK**

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Paper Session

**Coloration due to reflections**, by T Halmrast

[Sound Coloration](#) 13.03.2007

[Coloration due to reflections](#) — Further investigations. 03.08.2007

#### **Computational Acoustics**

[A new software tool to facilitate NURB based geometries in acoustic design](#) by O'Keefe et al 02.09.2013

[Learning Modern Acoustical Design from Traditional Choir Venues](#) by J O'Keefe 02.09.2013

[Ali Qapu—Historical Persian music room](#) by H Azad 10.01.2012

[Diffusion in concert halls analysed as a function of time during the decay process.](#) By C L Christensen and JH Rindel 24.05.2011

[Prediction tools in acoustics—can we trust the PC?](#) by M Vorländer 14.05.2010

[How dry do the recordings for auralization need to be?](#) by A Buen 31.01.2009

[Acoustical Modelling with Sonel Mapping](#), by Kapralos, Jenkin and Milios. 25.09.2007

[Edge Diffraction in Room Acoustics Computer Modeling](#), by P Svensson and P Calamia

[An Improved Energetic Approach to Diffraction Based on the Uncertainty Principle](#), by U Stephenson and P Svensson. 21.09.2007

#### **Low Frequency Limit of Reflector Arrays**

2008: [Frequency limits of reflector arrays—status report](#) 27.08.2008

2008: [Frequency Response of Reflector Arrays](#)

2007: [The two-filter model. Edge density to cut off frequency relationship. Dependency on angle of incidence and shape. Frequency range](#) 17.05.2007

2006: [Panel edge density suggested as design parameter for concert hall reflectors](#)

#### **Large Room Acoustics— misc papers**

[Acoustics of the Great Hall of the Moscow State Conservatory after Reconstruction in 2010–2011](#), by N.G. Kanev, A.Ya. Livshits, and H. Möller

[Consistency in music room acoustics](#), by M Skålevik 25.07.2014

[Rehearsal room acoustics for the orchestra musician](#), by M Skålevik 04.06.2014

[Concert hall preference prediction—uncertainties from using a selection of data](#) , by M Skålevik

[Room Acoustical Parameters in predictions of concert hall preference - about uncertainties, explanation and understanding](#) , by M Skålevik 22.0

[A new method to predict and measure the noise control performance of a performing arts centre displacement system](#) , by J O'Keefe 28.08.2012

[Korundi – The new home for the Lappland chamber orchestra](#) , by H Möller 03.07.2012

[The Logomo Hall](#) , by Riionheimo et al 03.07.2012

[Music Room Acoustics - Critical parameters](#) by M Skålevik 23.04.2012

[Concert Hall Parameters 2012—Status Report](#) by M Skålevik 23.04.2012

[On a new, variable absorption product and acceptable tolerances of T30 in halls for amplified music](#) by Adelman-Larsen et al 06.03.2012

[Audibility of direct sound as a key to understand clarity of music and speech](#) by D Griesinger

[Non-linear decays in simple spaces and their possible exploitation](#) by M Barron 13.06.2011

[The effect of scattering surfaces in rectangular concert halls](#) by Green, Barron, Thompson 09.06.2011

[Uncertainties of room acoustical measurements](#) by I Witew and M Vorländer 09.06.2011

[Concert Hall Parameters - We still haven't found what we're looking for](#) by M Skålevik 19.04.2011

[Queen Elisabeth Theatre: Acoustic design responding to financial realities](#) by J O'Keefe 16.04.2011

[Speech Intelligibility Measurements in Auditorium](#) by K Leo 19.10.2010

[Acoustic description of the Great hall of the Moscow P. I. Tchaikovsky Conservatory](#)

by H Möller et al 12.09.2010

[Phase Coherence](#) as a Measure of Acoustic Quality: by D Griesinger 03.09.2010

[1 The Neural Mechanism;](#)

[2 Perceiving Engagement;](#)

[3 Hall Design](#)

[Sound Strength in Small Halls](#) by J Hyde and H Möller 12.09.2010

[Behaviour of lateral energy in small concert halls](#) by H Möller and J Hyde 12.09.2010

[How loud is my reverberation?](#) by D Griesinger 03.09.2010

[Room acoustical parameters at listeners' ears—can preferred concert hall acoustics be predicted and explained?](#) (ICA 2010 preprint) by M Skålevik 17.06.2010

[Early Design Criteria for Multipurpose Cultural Houses](#) by A Buen 21.05.2010

[Reverberation Time—the mother of all room acoustical parameters](#) by M Skålevik 20.03.2010

[Acoustical problems in large post-war auditoria](#) by J O'Keefe 10.03.2009

[The Queen Elisabeth Theatre - Spatial Sound in a Wide Room](#) by J O'Keefe 10.03.2009

[The Esplanade - From Plenum to Flytower](#) by J O'Keefe 10.03.2009

[Simplified room acoustic measurements](#) by T Halmrast and A Buen 10.02.2009

[Room acoustics in two variable acoustics coupled space venues](#)

by A Buen and L Strand 31.01.2009

[Objective assessment of concert hall acoustics](#) by M Barron 09.10.2008

[Room acoustic parameters - distribution over concert hall seating area](#) by M Skålevik 25.08.2008

[When is a concert hall too quiet?](#) by M Barron 23.09.2008

[Diffusivity and its effect on concert hall seat absorption](#) by M Skålevik 25.08.2008

[Frequency Response of Reflector Arrays](#), a student project by M Dalåmo, NTNU 2007, 09.04.2008

[The Acoustics of a Quarry](#), Who needs an acoustician? T Halmrast asks. 03.08.2007

[Diffusivity and directivity](#) by M Skålevik. Early reverberant sound can compensate for unreliable direct sound. Read more in this paper. 09.10.2008

[Influence of ceiling profile on distribution of room acoustical parameters](#), by U Stephenson. 21.09.2007

[Evaluation of Objective Echo Criteria](#), A Løvstad's Master Thesis on Echo Criteria, introducing a new criterion. 25.08.2006

[Clarity and Source Blend](#) This paper by G Ihlen, acoustician and member of The Norwegian Opera Orchestra, discusses clarity, source blend, transparency and their interrelation. 20.09.2006

[Another Phantom of the Opera](#) Are there more than one phantom in the opera? This paper introduces a possible acoustical phantom. 14.03.2007

[Reflector above the opera orchestra pit](#) by T Halmrast, A Buen, G Ihlen. How should the reflector be shaped, to meet the intentions? A case study from the Norwegian National Opera in Oslo. 14.03.2007

### **Small Room Acoustics**

[How much scattering is sufficient to soften the Hard Case in small room acoustics?](#), by M Skålevik 25.07.2014

[Consistency in music room acoustics](#), by M Skålevik 25.07.2014

[Rooms for music – Acoustical needs and requirements](#), by J H Rindel 04.06.2014

[Rehearsal room acoustics for the orchestra musician](#), by M Skålevik 04.06.2014

[Musicians' perceived timbre and strength in \(too\) small rooms](#), by T Halmrast 02.09.2013

[The Hard Case - Improving Room Acoustics in Cuboid Rooms by using Diffusors - Scale model measurements](#) by J Vennerød 28.08.2013

[Small Room Acoustics - The Hard Case](#) (Forum Acusticum 2011 paper) by M Skålevik 19.04.2011

[Schroeder Frequency Revisited](#) (Forum Acusticum 2011 paper) by M Skålevik 17.04.2011

### **Stage Acoustics**

[On Measurements of Stage Acoustic Parameters: Time Interval Limits and various Source–Receiver Distances](#) by Wenmaekers et al 26.08.2013

[The influence of Room Acoustic Aspects on the Noise Exposure of Symphonic Orchestra Musicians](#) by Wenmaekers et al 26.08.2013

[A Model for the prediction of Sound Levels within a Symphonic Orchestra based on measured Sound Strength](#) by Wenmaekers et al 26.08.2013

[Subjective and objective measures of relevance for the description of acoustics conditions on orchestra stages](#) by A Gade 13.06.2013

[Acoustics for Symphony Orchestras: status after three decades of experimental research](#) by A Gade 04.03.2013

[Reflection Density and Attenuation on Stages and Rehearsal Halls](#), J O'Keefe, 16.09.2010

[Stage acoustics for symphony orchestras in concert halls](#), PhD thesis by JJ Dammerud. 20.05.2010

Earlier papers by Dammerud and Barron:

[Stage conditions for orchestral performance](#), by Dammerud / Barron. Early subjective and objective studies of concert hall conditions for orchestral performance. 21.09.2007

[Stage Acoustics - Early investigations](#) A contemporary overview of investigations and a few results so far, by Mike Barron and Dammerud. 02.05.2007

[Model Investigations](#), by Jens Jørgen Dammerud, University of Bath, September 2006. Supervised by Mike Barron. 16.04.2006

[Stage Acoustics—Literature Review](#), by Jens Jørgen Dammerud, University of Bath, November 2006. Supervised by Mike Barron. 13.12.2006

The content of this paper has been reviewed and included in the PhD thesis [Stage Acoustics for Symphony Orchestras in Concert Halls](#) 20.05.2010

[Stage Acoustics for a symphony orchestra—an investigation](#), by Alf Berntson and Johan Andersson. 22.10.2007

[Sound transmission through a symphony orchestra](#), by Magne Skålevik. Report on measurements on a stage with an orchestra present. 17.05.2006

[Orchestra Canopies—Significant Features](#) by Magne Skålevik. Orchestra canopies—do they make a useful difference and can it be measured? 13.10.2006

On the significance of stage floor construction, to instruments with endpin contact:

[Double Basses on the Stage Floor](#) (2007 paper) by Guettler, Askenfelt and Buen

[An in-depth analysis of the double bass to stage floor contact](#) (2008 paper) by Guettler, Askenfelt and Buen

[The Lindeman Hall of Oslo — Evidence of low frequency radiation from the stage floor](#) (2010 paper) by Guettler, Askenfelt and Buen

### **Violin Acoustics**

Seven papers by Anders Buen on violin acoustics are presented below. *Published akutek.info 16.04.2007 thru 18.10.2010*

[On Timbre Parameters and Sound Levels of Recorded Old Violins](#)

[What is old Italian timbre?](#)

[Operating deflection modes in five conventional and two unconventional violins](#)

[Can we hear the geometrical measures of a violin?](#)

[Violin Acoustics History - a brief introduction](#)

[Differences of sound spectra in violins by Stradivari and Guarneri del Gesù](#)

[Comparing the sound of golden age and modern violins: Long-time-average-spectra](#)

Ariadne Westerkamp (1990): [Die Geige gestrichen und verglichen](#) (19MB)  
English introduction and summary: [Sound of Science—108 violins talk](#)

*Published akutek.info 02.01.2012*

*Published akutek.info 03.01.2012*

### **Voice acoustics**

[Sound radiation from the chest of bass singers](#) by Magne Skålevik, the SMAC-93 paper original print. The chest is to the voice like the vented loudspeaker enclosure is to the loudspeaker. *14.02.2008*

## External sources — www papers

Lord Rayleigh (1877/1894) [The Theory of sound Vol 1](#)

W.C Sabine [Collected Papers on Acoustics](#)

D Griesinger: [Why do Concert Halls sound different – and how can we design them to sound better?](#)

P Svensson: ["The Early History of Ray Tracing in Room Acoustics"](#)

J Meyer: ["Acoustical aspects of the conductor's situation in front of the orchestra"](#) (13MB pdf)

J Sundberg: ["Arriving in time. A major concern for conductors & musicians"](#)

A Krokstad: ["The hundred years cycle in room acoustic research and design"](#) (19MB pdf)

A Krokstad: ["The common-mode rejection of the ear and its influence on the hearing of born and unborn"](#)

A Krokstad: [Music and Communication](#) (12MB pdf)

G Fleischer: ["Strategies of the hearing system against noise and auditory damage"](#) (25MB pdf)

L Beranek: ["Objective and subjective evaluations of 23 opera houses in Europe, Japan and the Americas"](#)

L Beranek: ["Subjective rank-orderings and measurements of 58 concert halls"](#)

L Beranek: ["Analysis of Sabine and Eyring equations and their application to concert hall audience and chair absorption"](#)

L Beranek: [Concert Hall Acoustics 2008](#)

**J-STAGE-session:** Click title below. If window with "URL does not exist" appears, click "J-STAGE HOME", close window and click title below again

M Barron: [Using the standard on objective measures for concert auditoria, ISO 3382, to give reliable results](#)

Witew, Behler, Vorländer: [About just noticeable differences for aspects of spatial impressions in concert halls](#)

J Jaffe: [Innovative approaches to the design of symphony halls](#)

Ueno, Kanamori Tachibana: [A sound field simulation system for the study of ensemble performance on a concert hall stage](#)

Rossing, Yoo, Morrison: [Acoustics of percussion instruments: An update](#)

Furuya et al: [The influence of total and directional energy of late sound on listener envelopment](#)

Kenji Kiyohara, Ken'ichi Furuya, Yutaka Kaneda: [Sweeping echoes perceived in a regularly shaped reverberation room](#)

A Løvstad and P Svensson: [Diffracted sound field from an orchestra pit](#)

J Bradley: [Using ISO 3382 measures, and their extensions, to evaluate acoustical conditions in concert halls](#)

M Morimoto and K Iida: [Appropriate frequency bandwidth in measuring interaural cross-correlation as a physical measure of auditory \(source width \(ASW\)](#)

Y Lam: [Issues for computer modelling of room acoustics in non-concert hall settings](#)

M Nagata (1989): [Design problems of concert hall acoustics](#)

M Nagata (1991): [Active sound field control systems in auditoriums - Expectations and precautions](#)

Ueno and Tachibana: [Cognitive modeling of musician's perception in concert halls](#)

Nijs and de Vries [The young architect's guide to room acoustics](#)

Hanyu and Hoshi: [Relationship between reflected sound density and mean free path in consideration of room shape complexity](#)

Kob, Behler, et al: [Experimental investigations of the influence of room acoustics on the teacher's voice](#)

Manfred R. Schroeder (1980): [Advances in architectural acoustics](#)

T Lokki [Subjective comparison of four concert halls based on binaural impulse responses](#)

[Imaging concert hall acoustics using visual and audio cameras](#)

Allen and Berkley: [Image method for efficiently simulating small-room acoustics](#)

B Martin: [What is the transmission loss of an open window?](#)

Lokki and Pätynen: [Lateral reflections are favorable in concert halls due to binaural loudness](#)

S Douady et al: [The song of the dunes as a self-synchronized instrument](#)

D'Antonio and Rife: [The state of the art in the measurement of acoustical coefficients](#)

K F Hansen [The acoustics and performance of DJ scratching](#)

Bradley: [Evolution of newer auditorium acoustics parameters](#)

Olsson, Söderström and de Sousa Mestre: [Sound levels for trumpet players in practice rooms](#)

Olsson and Söderström, Master Thesis 2010: [Perceived Sound Qualities for Trumpet Players in Practice Rooms](#) (11.8MB)

Beranek, Jaffe, Nakajima, Kahle, Kirkegaard and Clements: ["How acousticians listen?"](#) (5.5MB)

Dammerud, Barron and Kahle: ["Objective assessment of acoustic conditions on concert hall stages – limitations and new strategies"](#)

Ueno and Tachibana: ["A consideration on acoustic properties on concert-hall stages"](#)

Chiang, Yi-run Chen, Chen and Hsu, ["Stage acoustics for vineyard concert hall"](#)

Pompoli, Farnetani and Prodi: ["A note on the acoustics of orchestra rehearsal rooms"](#)

Jang, Kim and Jeon: ["Absorption of orchestra platform measured for the acoustical design of concert halls"](#) (Scale model study)

Lautenbach and Vercammen: ["Stage acoustics: Renovation of the concert hall de Doelen, Rotterdam and other stages"](#)

Roy and Browne: ["Classroom acoustics and green schools"](#)

Luykx and Vercammen: ["Natural speech intelligibility in theatres in relation to its acoustics"](#)

Vigeant, Wang, Rindel, Christensen and Gade: ["Multi-channel orchestral anechoic recordings for auralizations"](#)

R Freiheit: ["Creating an anechoic choral recording"](#)

Pätynen and Lokki: ["Evaluation of concert hall auralization with virtual symphony orchestra"](#)

T Gulsrud: ["Loudspeaker simulation of a string quartet for \*in situ\* listening evaluation"](#)

Choi, Lee, Joo and Jeong: ["Effect of sample size on measurement of the absorption by seats"](#)

Martijn Vercammen: ["Improving the accuracy of sound absorption measurement according to ISO 354"](#)

Tervo, Korhonen and Lokki: ["Estimation of reflections from impulse responses"](#)

You, Kim and Jeon: ["Effects of absorption elements and stage set on the stage house acoustics in a proscenium hall"](#)

Witew, Dietrich, Vorländer and de Vries: ["Uncertainty of room acoustical measurements – How many measurement positions are necessary to determine conditions in auditoria?"](#)

Figueiredo and Polack: ["Variations on acoustical measurement procedures and their influence on acoustical parameters"](#)

J Bradley: ["Review of objective room acoustics measures and future needs"](#)



Alban Bassuet: ["New acoustical parameters and visualization techniques to analyze the spatial distribution of sound in music spaces"](#)

Lokki, Vertanen, Kuusinen, Pätynen and Tervo: ["Auditorium acoustics assessment with sensory evaluation methods"](#)

Marshall, Scelo and Exton: ["Whole stage imaging for the control of sound strength in concert halls"](#)

R Harris: ["Auditorium acoustic design: 30 years, 15 projects"](#)

L Tronchin: ["The reconstruction of the Teatro Galli in Rimini: the acoustic design"](#)

Gulsrud, Exton, van der Harten and Kirkegaard: ["Room acoustics investigations in Hamer Hall at the Arts Centre, Melbourne"](#)

Gul and Caliskan: ["Acoustical considerations in the design of Heydar Aliyev Center Auditorium"](#)

Komoda, Hakozaiki and Toyota: ["Acoustical design of new Danish Radio concert hall"](#)

Chiang, Lin, Yeh and Hsu: ["A mid-size concert hall with staggered terraced seating"](#)

Yoo, Seo, Kim and Jeon: ["Acoustical renovation of large auditorium to enhance sound strength and IACC"](#)

Kim, Seo, Yoo and Jeon: ["The effect of reflectors on sound strength \(G\) and IACC in a fan-shape hall"](#)

Ellison and Schwenke: ["The case for widely variable acoustics"](#)

J Hyde: ["Acoustical intimacy in concert halls—Does visual input affect the aural experience?"](#)

Hidaka, Beranek and Nishihara: ["A comparison of shoe-box halls and non-shoebox halls based on objective measurements in actual halls"](#) (RECO)

J van Dorp Schuitman (Thesis): [Auditory Modelling for Assessing Room Acoustics](#)

Bradley and Soloudre: ["Factors Influencing the Perception of Bass"](#)

R Lacatis: [Historical and chronological evolution of the concert hall acoustics parameters](#)

H Arau-Puchades: [An Improved Reverberation Formula](#)

H Arau: [The Refurbishment of the Orchestra Rehearsal Room of the Great Theater of Liceu](#)

Neubauer and Kostek: [Prediction of the Reverberation Time in Rectangular Rooms with Non-Uniformly Distributed Sound Absorption](#)

Sigrún Ragna Helgadóttir: [SCHROEDER DIFFUSORS](#)

Eckard Kahle: [Influence of Size and Composition of the Orchestra on the Perception of Room Acoustical Quality](#)

D Griesinger: [FURTHER INVESTIGATION INTO THE LOUDNESS OF RUNNING REVERBERATION](#)

Luxemburg et al: [Stage acoustics: Experiments on 7 stages of concert halls in the Netherlands](#)

Youngmin Kwon: [Music Halls from the 18th to 20th Centuries: Changes in Acoustical and Architectural Criteria](#)

J O'Keefe: [The Influence of Height to Width Ratio and Side Wall Boxes on Room Acoustics Measurements](#)

Kowaki et al: [Survey of the Acoustics of Concert Halls in European Countries](#)

Hameed, Pakarinen, Valde and Pulkki: [Psychoacoustic Cues in Room Size Perception](#)

Dilworth and Smyth: [The acoustic requirements of the Irish Chamber Orchestra](#)

Tenenbaum et al: [Acoustical Analysis of a Variable Roof Configuration Concert Hall: Sala Sao Paolo](#)

A W Bronkhorst: [Modeling Auditory Distance Perception in Rooms](#)

A Bassuet: [Acoustics of a selection of famous 18th century opera houses: Versailles, Gräffliches, Drottningholm, Schweitzingen](#)

Kato, Ueno, Kawai: [Musicians adjustment of performance to room acoustics, Part III: Understanding the variations in musical expressions](#)

Klosak and Gade: [Relationship between room shape and acoustics of rectangular concert halls](#)

Oguchi and Toyota: [Acoustic design of Shenzhen concert hall, Shenzhen, China](#)

Zerhan Karabiber: [Acoustical Problems in Mosques](#)

Altinsoy and Blauert: [Do we feel what we hear? \(Louder perceived as stronger though force is unchanged\)](#)

Alban Bassuet: [Acoustics of Early Music Spaces from the 11th to 18th Century: Rediscovery of the Acoustical Excellence of Medium-Sized Rooms](#)

Kwon and Siebein: [Music Halls from the 18th to 20th Centuries: Changes in Acoustical and Architectural Criteria](#)

Harald Jers: [What Are the Differences Between Amateur and Professional Choirs?](#)

Marshall, Valentine and Scelo: [PHILHARMONIC ACOUSTICS](#)

Stetson and Braasch: [The Singers' Preferences for Acoustical Characteristics of Performing Spaces](#)

Boner and Harght: [The Festival Hill Concert Hall](#)

Ronsse and Wang: [Impacts of classroom acoustics on elementary student achievement](#)

Parks and Braasch: [You Are Now Free to Move Your Head around the Concert Hall](#)

D Griesinger: [How Can You Tell Who's Talking? The Ability to Separate Sounds by Pitch as a Key to Measuring the Clarity of Speech and Music](#)

Dance et al: [Improving Orchestra Pits for the Benefit of Musicians](#)

Neville Fletcher: [The Evolution of Musical Instruments](#)

Tapio Lokki: [Sensory Evaluation of Concert Hall Acoustics](#)

Wulfrank et al: [Recent experiences with vibration of stage and audience floors in concert halls](#)

Tervo, Pätynen, and Lokki: [Spatio-temporal energy measurements in renowned concert halls with a loudspeaker orchestra](#)

Beranek and Nishihara: [Mean-free-paths in concert and chamber-music halls and validation of the Sabine/Eyring equations for predicting their reverberation times](#)

Jofre et al: [Evaluation of stage acoustics preference for a singer using oral-binaural room impulse responses](#)

Ko et al: [Augmented stage support in ensemble performance using virtual acoustics technology](#)

Y Ando: [Autocorrelation-based features for speech representation](#)

Toyota, Oguchi and Nagata: [Acoustical Design of Walt Disney Concert Hall](#)

M Schröder: [Remembering the Good Days at Bell Labs](#)

M Sakurai: [Computational Systems for Sound Fields, as Tools in Design and Diagnosis](#)

Huttunen et al: [Symphony orchestra musicians' use of hearing protection and attenuation of custom-made hearing protectors as measured with different real-ear attenuation at threshold methods](#)

A Vink: [Music and Emotion: - a relationship between music psychology and music therapy](#)

Heyl, Chrisler and Snyder (1929): [The Absorption of Sound at Oblique Angles of Incidence](#)

Pätynen, Tervo and Lokki: [Investigations on the development of the frequency response over time in concert halls](#)

Robinson, Pätynen and Lokki: [The effect of diffuse reflections on spatial discrimination in a simulated concert hall](#)

Pätynen, Tervo and Lokki: [Analysis of concert hall acoustics via visualizations of time-frequency and spatiotemporal responses](#)

Don Oeters: [The effect of scattering objects on measured reverberation times in sport halls](#) Related papers: Vennerød: [The Hard Case—Scale measurements](#); Skålevik: [Small Room Acoustics - The Hard Case](#)

Mirowska and Czyzewski: [Estimation of sound absorption coefficients of porous materials](#)

Dance et al: [Improving Orchestra Pits for the Benefit of Musicians](#)

E Hatlevik: [Are Musicians Affected by Room Acoustics in Rehearsal Rooms?](#)

Choisel and Wickelmaier: [Auditory attributes of multichannel sound and objective parameters](#)

A.C. Gade: [Room acoustic properties of concert halls: quantifying the influence of size, shape and absorption area](#)

M Long: [What is so special about shoebox halls? Envelopment, envelopment, envelopment.](#)

#### **BBC research and development**

BBC R&D report from 1933: [Acoustics of Cardiff Studios](#) (0.4s in "small", 1.2s in 730m<sup>3</sup> and 0.25s in 25m<sup>3</sup>)

BBC R&D report from 1934: [Aberdeen Studios](#)

T Sommerville 1948: [Acoustic measurements in Aberdeen studios](#)

T Sommerville 1948: [Listeners' sound level preferences](#)

T Sommerville: [Göttingen conference 1951](#)

Gilford and Sommerville 1951: [Acoustics of Royal Festival Hall](#)

Sommerville, Gilford and Beadle 1952: [Subjective comparison of concert halls](#)

T Sommerville 1953: [An Empirical Acoustic Criterion](#)

T Sommerville 1955: [Sound level distribution in concert halls](#)

T Sommerville, 1956: [Visit to Switzerland](#)

T Sommerville 1958: [Acoustics in the BBC](#)

T Sommerville: [Visit to Scandinavia 1958](#)

T Sommerville 1963: [Architectural Acoustics and the Arts](#)

Sommerville and Gilford 1963: [Tonal quality in concert halls](#) (Appendix: The Times article: "Is clarity all we want from our concert halls?")

BBC research report 1964: [The choice and location of sound absorbers](#)

#### **Binaural hearing, Spaciousness, ASW, ENV/LEV/LE, LF and 1-iacc**

M Schröder: [Comparative Study of European concert halls: correlation of subjective preference with geometric and acoustic parameters](#)

[Spaciousness discussion \(ASW, LE, LF, 1-iacc\)](#)

[Typical values of LF and 1-IACC in famous concert halls](#)

Bradley: [Comparison of concert hall measurements of spatial impression](#)

De Vries: [Spatial fluctuations in measures for spaciousness](#)

Jeon: [Effect of sound strength and IACC on perception of listener envelopment in concert hall](#)

Griesinger: [Objective measures of spaciousness and envelopment](#)

Beranek: [Lateral Fraction and Binaural Quality Index \(discussion Concert halls 2008, sect 2 and 3\)](#)

Baalman (Thesis): [Spaciousness in concert halls. Perceptibility of IACC-differences](#)

Sue Harding [Binaural Processing](#)

Stern, Wang, Brown [Binaural Sound Localization](#)

A Oxenham (Lecture) [Binaural hearing](#)

Div Authors, ICA 2001 session: [Opera House Acoustics](#)

Morimoto: [The role of reflections from behind the listener on spatial impression](#)

Morimoto: [The relation between Spatial Impression and the Precedence Effect](#)

Mason, Brookes and Rumsey: [Spatial impression: measurement and perception of concert hall acoustics and reproduced sound](#)

Arnaud Bidart: [Do We Need Two Ears to Perceive the Distance of a Sound Source in a Room?](#)

R.Y Litovsky: [Binaural Hearing](#) (external site)

J Breebaart: [Sound Binaural processing model based on contralateral inhibition.I. Model structure](#)

[Sound Binaural processing model based on contralateral inhibition.II. Dependence on temporal parameters](#)

[Sound Binaural processing model based on contralateral inhibition.III. Dependence on temporal parameters](#)

Kolarik and Moore: [The Consequences of Blindness for Judging the Distance of Sound Sources: A “compression” of the auditory world](#)

## Stage Acoustics for symphonic orchestra

JJ Dammerud: [The ST measures without the standard reference level](#)

Wenmaekers et al (2011): The influence of Room Acoustic Aspects on the Noise Exposure of Symphonic Orchestra Musicians [\[pdf\]](#)

Wenmaekers et al (2011): A Model for the Prediction of Sound Levels within a Symphonic Orchestra based on measured Sound Strength [\[pdf\]](#)

Wenmaekers et al (2010): The influence of the orchestra on stage acoustics [\[pdf\]](#)

Luxemburg et al (2010): Stage acoustics further development of parameter LQ7-40 [\[pdf\]](#)

Luxemburg et al (2009): Stage acoustics experiments on 7 stages of concert halls in the Netherlands [\[pdf\]](#)

Braak et al (2009): New (stage) parameter for conductor's acoustics? - part 2: further investigation on LQ7-40 [\[pdf\]](#)

Braak et al(2008): New (stage) parameter for conductor's acoustics? [\[pdf\]](#)

Braak et al (2005): Influence of stage risers on stage acoustics [\[pdf\]](#)

## ISRA 2013 Toronto

Misc authors [ISRA 2013 Toronto, all papers](#)

Kalkandjiev and Weinzierl: [Room acoustics viewed from the stage: Solo performers' adjustments to the acoustical environment](#) (not in new window)

Skålevik: [Certainties and uncertainties from using a selection of data to predict concert hall preference](#)

Beranek: [Concert Hall Design: Some Considerations](#)

A Bidondo: [Neuroacoustics: Study on the perception of stereo reverberant sound field at cortical level](#)

D Bradley: [Comparison of hanging panels and boundary diffusers in a reverberation chamber](#)

H Marshall: [The acoustical design of the Christchurch Town Hall](#)

E Kahle: [Room acoustical quality of concert halls: perceptual factors and acoustic criteria – return from experience](#)

M Vorländer: [Simulation and Evaluation of Acoustic Environments](#)

T Lokki: [Throw away that standard and listen: your two ears work better](#)

## Listening levels

T Sommerville 1948: [Listeners' sound level preferences](#)

Muchnik et al: [Preferred listening levels of personal listening devices in young teenagers: self reports and physical measurements](#) (abstract)

L Warren: [Correlating Preferred Listening Levels With Feelings In Children In Grades 3-8](#)

Goshorn et al: [iPod Preferred Listening Levels for College Students](#)

M Sakurai: [Listening Room for Testing the Individual Subjective Preference](#) (A concert hall seat selection system)

E Deruty: ['Dynamic Range' & The Loudness War](#)

Federman and Ricketts: [Preferred and Minimum Acceptable Listening Levels for Musicians While Using Floor and In-Ear Monitors](#) (Blog report)

## **Lombard effect**

Garnier et al: [The Lombard Effect: a physiological reflex or a controlled intelligibility enhancement?](#)

Rindel and Christensen: [Dynamic sound source for simulating the Lombard effect in room acoustic modeling software](#)

P Lau: [The Lombard Effect as a Communicative Phenomenon](#)

S Tonkinson: [The Lombard effect in choral singing](#) (summary with main results, only)

Wikipedia article with links: [Lombard effect](#)